Synthesis of Cyclic Polybutadiene via Ring-Opening Metathesis Polymerization: The Importance of Removing Trace Linear Contaminants

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Supporting Information

Table 1. Synthesis of polybutadienes using 1,5-cyclooctadiene as monomer[a]

$[M/C]_0$	$[Monomer]_0$ (M)	% Yield[b]	M_n[c] ($x10^3$ Da)	PDI[c]
25	1.0	84	2.3	1.6
50	1.0	86	5.0	1.7
100	1.0	88	8.5	1.7
1150	1.0	87	86	1.9
100	0.5	83	2.2	1.7
100	0.1	0[e]	ND	ND
100	4.0	90	26	1.9
100	8.1[f]	95	145	1.8

[a] Polymerizations were conducted in CH_2Cl_2 at 45 ºC for 12 h. Monomer (M) = 1,5-cyclooctadiene (COD). Catalyst (C) = **1**. [b] Isolated yields. [c] Determined by size exclusion chromatography (SEC) with CH_2Cl_2 as eluent. The values are reported in Da and are relative to monodispersed polybutadiene standards. [e] Only low MW oligomers were observed by SEC. [f] Polymerization was performed in bulk COD. ND = Not determined.

Table 2. Synthesis of polybutadienes using 1,5,9-*trans*-*cis*-*trans*-cyclododecatriene as monomer[a]

$[M/C]_0$	$[Monomer]_0$ (M)	% Yield[b]	M_n[c] ($x10^3$ Da)	PDI[c]
1000	2.5	85	12	1.9
2500	2.5	80	32	1.8
6000	5.0	90	88	1.7
2500	1.0	0[e]	ND	ND

[a] Polymerizations were conducted in CH_2Cl_2 at 45 ºC for 12 h. Monomer (M) = 1,5,9-*trans*-*cis*-*trans*-cyclododecatriene (CDT). Catalyst (C) = **1**. [b] Isolated yields. [c] Determined by size exclusion chromatography (SEC) with CH_2Cl_2 as eluent. The values are reported relative to monodispersed polybutadiene standards. [e] Only low MW oligomers were observed by SEC. ND = Not determined.